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EXAMINER	
CRAWLEY, TALIA F	

ART UNIT	PAPER NUMBER
3687	

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01/20/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/671,932	CHEN ET AL.	
	Examiner	Art Unit	
	TALIA CRAWLEY	3687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *3* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/16/2009 has been entered.

Prosecution History Summary

- Claims 1-25 are pending in the instant application.
- Claim 3 has been cancelled per Applicant's submission dated 11/17/2009.
- Claims 1, 2, and 4-25 have been amended per Applicant's submission dated 11/17/2009.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in:

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-16 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Smartt (U.S. Patent No 5,963,956).

As per claim 1:

Smartt discloses a method of monitoring continual queries over moving objects, said method comprising: preliminarily establishing, using a processor on a computer, an object identification listing for each of an object being monitored, said object identification listing providing an indication of which shingles cover an object and which query region includes these shingles (see for example column 1, lines 63-67), said object identification listing being updated as said object moves (see for example column 13, lines 32-43);

Storing coordinates defining a query region in a memory (see for example column 14,lines 64-67);

retrieving from said memory, said coordinates of said query region representing a continual query over which movements of objects are to be monitored (see column 1, lines 63-67, Abstract, and column 27, lines 31-39); and constructing, using said processor of said computer and said retrieved coordinates, a covering for said query region said covering comprising at least

one shingle (see in particular column 13, lines 61-65), so that said query region is completely covered by said at least one shingle and no section of any said at least one shingle falls outside said query region; (see in particular column 13, lines 17-24, wherein the tiles as disclosed by Smartt are created based on the size of the region that is to be covered, thereby inherently keeping the tiles within the query region)

periodically, throughout a period of said continual query monitoring, receiving location information for each said object being monitored;

determining from said location information whether any said object is covered by any of said shingles of said query region; and

updating said object identification listing based on said determining (see in particular column 21, lines 7-11, and column 13, lines 18-67 and column 14, lines 39-67).

As per claim 2:

Smartt discloses the method of claim 1, wherein, when said at least one shingle strictly covering a said query region comprises a plurality of shingles, the shingles in said plurality are allowed to overlap (see in particular column 13, lines 61-65).

As per claim 3:

Smartt discloses the method of claim 1, further comprising: establishing, using said processor, an object identification listing for each object being monitored (see in particular column 18, lines 18-26), said object identification listing providing an indication of which shingles cover an object (see for example column 13, lines 36-43) and which query region includes these shingles

(see in particular column 21, lines 7-11); and updating said object identification listing as said object moves.

As per claim 4:

Smartt discloses the method of claim 1, wherein said shingles are all one predetermined shape (see in particular column 16, lines 54-57).

As per claim 5:

Smartt discloses the method of claim 1, wherein the query regions comprise predetermined geographical areas on the earth's surface (see in particular column 6, lines 63-67 and column 7, lines 1-2) and said shingles comprise at least one of: two-dimensional shapes; and three-dimensional shapes (see in particular column 16, lines 22-26).

As per claim 6:

Smartt discloses the method of claim 1, further comprising: for a query region, determining, using said processor, an optimal shingle size for said query region (see in particular column 10, ones 23-39).

As per claim 7:

Smartt discloses the method of claim 6, wherein said strictly covering said query region comprises: forming, using said processor, a first strip rectangle based on said optimal shingle

size, said first strip rectangle aligned along an edge of said query region in a first dimension (see in particular column 21, lines 16-20 and 37-40).

As per claim 8:

Smartt discloses the method of claim 7, wherein said first strip rectangle fails to strictly cover said query region, said method further comprising: relative to a second dimension, using said processor to form a second strip rectangle based on said optimal shingle size (see in particular column 14, lines 55-67 and column 15, lines 1-9).

As per claim 9:

The method of claim 8, wherein said optimal shingle size allows said second strip rectangle to strictly cover said query region (see in particular column 17, lines 24-37).

As per claim 10:

The method of claim 9, wherein said first strip rectangle and said second strip rectangle overlay in order to achieve said strictly covering (see in particular column 17, lines 24-37).

As per claim 11:

The method of claim 8, wherein said optimal shingle size does not permit said second strip to strictly cover said query region, said method further comprising: in said second dimension, using said processor for repeatedly forming a strip rectangle (see in particular column 7, lines 30-33 and 37-40) based on said optimal shingle size until said query region is completely covered by

strip rectangles, wherein a final strip rectangle is allowed to overlap a previous strip rectangle to achieve said strict covering (see in particular column 16, lines 62-67 and column 17, lines 1-5).

As per claim 12:

Smartt discloses the method of claim 7, further comprising: forming shingles, using said processor, in said first strip rectangle, each said shingle based on said optimal shingle size, so as to strictly cover said first strip rectangle (see in particular column 16, lines 66-67 and column 17, lines 1-5).

As per claim 13:

The method of claim 12, wherein the strictly covering of said first strip rectangle is achieved by allowing a last shingle in said first strip rectangle to overlap a previously-placed shingle (see in particular column 13, lines 61-65).

As per claim 14:

The method of claim 8, further comprising: for each strip rectangle formed, using said processor for (see in particular column 7, lines 30-32 and 37-40), forming shingles in said strip rectangle in a manner that strictly covers said strip rectangle (see in particular column 21, lines 16-20 and 34-40).

As per claim 15:

Smartt discloses the method of claim 3, further comprising: maintaining, in a memory of said computer (see for example column 27, lines 31-39), a query index of objects that are located in each query region, as based on which shingles cover the objects of interest (see in particular column 9, lines 17-25 and lines 55-58).

As per claim 16:

Smartt discloses the method of claim 15, wherein certain query evaluations are skipped by filtering out a subset of said objects of interest that have not moved from a shingle previously covering the object (see in particular column 13, 39-45).

As per claim 25:

Smartt discloses a signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of monitoring continual queries over moving objects, said method comprising: receiving coordinates defining one or more query regions, each said query region comprising a region over which said moving objects are being continually monitored (see for example column 21, lines 6-19); constructing a cover strictly covering each of a query region by at least one shingle, (see for example column 14, lines 9-23), wherein said strictly covering function comprises completely covering said query region by at least one shingle and no section of any said at least one shingle falls outside said query region; periodically receiving location information of each object being monitor and determining whether each said monitor object is covered by any of said shingles; and reporting

locations of said objects based on said determining (see for example column 16, lines 29-39 and column 27, lines 39-59).

4. Claims 17-20, 22, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Jagadish et al. (U.S. Patent No 7,010,522).

As per claim 17:

Jagadish et al discloses a system of monitoring continual queries over moving objects, said system comprising:

a module executed on a computer that receives coordinates defining one or more query regions, constructs a cover that strictly covers each query region with at least one covering shingle, each said query region being a region represented in a digital format over which said objects are to be continually monitored (see for example column 3, lines 32-46), wherein the strictly covering function comprises completely covering a query by at least one said covering shingle, wherein none of said shingles strictly covering said query extends outside said query (see in particular column 6, lines 44-55, wherein the qgram is a digital area that is created to query various objects that are assigned string identifiers, such that the location of a string identifier within a qgram can be determined based on a query of the identifiers present within a particular qgram, whose areas are predetermined by the user), and each said shingle strictly covering said query is permitted to overlap another shingle strictly covering said query, and determines whether any object being monitor is currently covered by any of said covered shingles (see in particular column 6, lines 15-29, wherein the qgrams are overlapping and column 2, lines 39-64).

As per claim 18:

Jagadish et al discloses the system of claim 17, further comprising: a calculator, executed on said computer that skips certain query evaluations by filtering out a subset of said moving objects using said strict covering shingles (see in particular column 2, lines 47-52).

As per claim 19:

Jagadish et al discloses the system of claim 18, wherein said calculator further constructs a query index based on said covering shingles and said filtering out a subset of moving objects is based on said query index.(see in particular column 6, lines 15-28 and column 7, lines 61-64)

As per claim 20:

Jagadish et al discloses the system of claim 18, wherein said filtering out a subset of said moving objects is based on determining a relative movement since the last position with respect to shingle boundaries (see in particular column 7, lines 29-54).

As per claim 22:

Jagadish et al discloses the system of claim 18, wherein said filtering out a subset of said moving objects, further comprises: computing the covering shingles of an old object location; computing the covering shingles of a new object location; deleting an object ID instance from object lists associated with the queries that are covered by the covering shingles of the old location but not

of the new location; and inserting an object ID instance into object lists associated with the queries that are covered by the covering shingles of the new location but not of the new location (see in particular column 8, lines 30-50).

As per claim 23:

Jagadish et al discloses the system of claim 18, wherein the filtering out of a subset of moving objects further comprises: computing the covering shingles of an old object location; computing the covering shingles of a new object location; and taking no action for queries that are covered by the covering shingles of both the new and the old locations (see in particular column 8, lines 30-50).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jagadish et al. (U.S. Patent No 7,010,522), in view of Smartt (US Patent No. 5,963,956).

In regards to claim 21, Jagadish et al. disclose a system of monitoring continual queries over moving objects, as applied above in the rejection of claims 17-19 under 35 U.S.C. 102(e), but Jagadish et al. do not explicitly disclose filtering out a subset of moving objects is based on building of a query index, said calculator further: predefining a set of shingles; strictly covering a range query with one or more said singles (this word has been interpreted to be shingles for the sake of examination); and maintaining the ID of said range query with said covering shingles. However, Smartt teaches filtering out a subset of moving objects is based on building of a query index, said calculator further: predefining a set of shingles; strictly covering a range query with one or more said singles (this word has been interpreted to be shingles for the sake of examination); and maintaining the ID of said range query with said covering shingles (see in particular column 13, lines 31-43 and lines 60-65; column 14, lines 3-6, 9-13, and 16-23). Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to modify the invention as disclosed by Jagadish to maintain the ID of said shingles in a query index, because the usage of ID within the query indexing process would assist in the facilitation of filtering, and further reduce the amount of time necessary for the monitoring of object location.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smartt (US Patent No. 5,963,956).

In regards to claim 24, Smartt discloses a service based on a computerized monitoring continual queries over moving objects, said service comprising at least one of: providing a monitoring of moving objects against continual queries, using a computer, each said query being a region represented in a digital format and representing a region over which said moving objects are to be continually monitored (see for example column 14, lines 9-23) using a method comprising: receiving coordinates defining at least one query region in a processor of a computer; constructing a cover strictly covering of each said query region by at least one shingle, using said processor, wherein said strictly covering function comprises completely covering a query region by said at least one shingle and no section of any said at least one shingle falls outside said query region, determining, using said processor, whether any object being monitored is covered by any of said shingles of said query regions; and reporting location information of said moving objects based on said determining (see for example column 27, lines 39-49), but does not explicitly disclose providing a result of said monitoring using said method; and using a result of said monitoring using said computerized method.
However, based on the broadest interpretation of the claim as written, providing a result of a query and using a result of a query is well known to one or ordinary skill of the art, and official notice to that effect is hereby taken.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified the system of Smartt so as to have included providing a result of said monitoring using said method; and using a result of said monitoring using said method, in order to enable the user to use query results to monitor and track moving objects, since doing so could

be performed readily and easily by any person of ordinary skill in the art, with neither undue experimentation, nor risk of unexpected results.

Response to Arguments

Applicant's arguments filed 11/17/2009 have been fully considered but they are not persuasive.

Applicant asserts that the reference Smartt does not disclose wherein the method is directed toward monitoring continual queries over moving objects, wherein the region breakdown occurs for the query, not the contents of an underlying database. The Examiner respectfully disagrees. A range query, which is what is disclosed in Applicant's specification and used to locate the aforementioned moving objects of the claimed invention is, as understood by one of ordinary skill in the art, a database operation that retrieves all records where some value is between an upper and lower boundary. In the case of the claimed invention, the values that are sought are the coordinates of moving objects within a certain area. The method of Smartt also uses shingles (as denoted in the claimed invention) to cover a query region, which is simply a predefined area to determine locations of objects (see in particular column 13, lines 17-45, wherein a coordinate system overlays large quantities of spatial data [query region] and the coordinate system in turn is separated into sub-regions, wherein the tiles are superimposed over the coordinate system that included the spatial data [shingles]).

The Applicant further asserts that the reference Smartt fails to teach or suggest wherein the method is directed toward moving objects. The Examiner respectfully disagrees. The claimed invention requires that the moving objects be monitored by performing continual queries over a specific area to determine whether the coordinates of the objects have changed in relation

to their original location. By determining if the old and the new location of the object are different, one can determine whether the object has moved. Although the reference Smartt does not explicitly disclose wherein the objects of the disclosure are moving, one of ordinary skill would recognize that it is inherent that by determining that the original location of an object and the new location of the object are no longer the same, that the object has moved.

Applicant also asserts that the reference Smartt does not disclose wherein an optimum size of shingles is constructed over a predefined query region. The Examiner respectfully disagrees. The reference clearly shows wherein the query region is predefined (see at least column 14, lines 55-59, wherein spatial data objects are organized in a map database, including referencing data objects as location points in a region to a coordinate system. Further, the reference shows wherein the query region is broken up into sub regions [tiles or shingles] which are superimposed over said coordinate system (see at least column 13, lines 32-36).

Regarding Applicant's assertion that the teachings of the reference Jagadish et al are not analogous with the query regions and moving objects taught by the claimed invention, the Examiner respectfully disagrees. The system and method of Jagadish et al uses string based querying and searching, rather than area based, as disclosed by the claimed invention and the prior art reference Smartt. However, the reference Smartt in view of the reference Jagadish et al would render obvious the limitations of claims 17-20, 22, and 23. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TALIA CRAWLEY whose telephone number is (571)270-5397. The examiner can normally be reached on Monday to Thursday eight to five.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Gart can be reached on 571-272-3955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. C./
Examiner, Art Unit 3687
01/15/2010

/Matthew S Gart/
Supervisory Patent Examiner, Art Unit 3687